Chapter 10

WORKING WITH STUDENTS USING THE CROSS-CONTENT WORKPLACE READINESS STANDARDS

INTRODUCTION

To help prepare students for a rapidly changing world, the State Board adopted five workplace readiness standards to be integrated with the seven academic standards. These standards define the skills that students need as they pursue college, careers, and adult responsibilities as citizens. The cross-content workplace readiness standards include career planning and workplace skills; use of technology, information, and other tools; critical thinking, decision making, and problem solving; self-management; and safety principles.

Unlike the cumulative progress indicators for the other content areas, the workplace readiness indicators are not organized by grade-level clusters because, in addition to crossing all content areas, they also cross grade levels. Teachers and counselors should integrate these concepts into all programs in content-specific and developmentally appropriate ways. To strengthen the linkages between the content area and cross-content workplace readiness standards, the learning activities of the Science Framework and other frameworks include interdisciplinary approaches to workplace readiness.

To prepare students adequately for the world of tomorrow, teachers should enlist the assistance of additional members of the educational team (such as the school counselor, school nurse, and school library media specialist) as well as the business community in the delivery of workplace readiness knowledge and skills. For example, the school counselor is able to coordinate, consult, collaborate, serve as a resource, and facilitate in order to assist students in the academic, vocational, and personal arenas. School nurses, drawing from their knowledge of the health-care system, can facilitate service learning experiences, arrange for speakers, coordinate visits to community agencies and health-care providers, and provide hands-on working experiences in the school health office. Library media specialists provide print and technological resources in the library media center that are available to all students during the entire school day and, often, before and after school. The resource people can assist by supporting cross-curriculum and multidisciplinary instruction for all grades and reading levels. Members of the business community can serve as speakers, provide state-of-the-art materials and/or information, and serve as mentors in work-based experiences or part-time employment.

The counselor is pivotal to the success of integrating into the instructional program any school-based and work-based learning experiences. It is equally evident that the roles of other specialists within the school and work environments need to evolve with the implementation of the cross-content workplace readiness standards. Also, the connecting activities between school and work need to be facilitated at the administrative level in each district. With the integration of the cross-content workplace readiness standards, each content framework assists the entire educational team in the process of curriculum development, revision, and implementation.

PUTTING IT ALL TOGETHER

As society becomes more complex, "traditional" education becomes less relevant due to its fragmentary nature. A more effective and engaging approach to educating can be found in the combining of two existing instructional approaches. The combination of *interdisciplinary instruction*, which combines several content disciplines in a common lesson or activity, and the use of a *systems approach* to develop an overview perspective of the actions and forces that impact the activity will produce a highly motivating and engaging frame for learning. Such an approach encompasses *experiential education* where students learn by doing, by helping to select and design projects, by researching possible solutions, by presenting their work to outside review panels, and, finally, by evaluating their work on their own terms. Academic content is integrated into all of these activities so that students keep up with, and actually surpass, what the standards require.

The use of hands-on learning activities increases opportunities for student involvement and adds a sense of personal meaning for the students. They are given an opportunity to practice interacting with the real world around them. Students are excited and motivated by projects in which they play key decision-making roles. They learn to communicate, to create, to think on their feet, and to meet tight timelines. They learn how to work on a team, how to be responsible leaders, and how to listen to and carefully consider the ideas of others. Throughout the process, students gain confidence from the respect and self-satisfaction their success earns.

The following three vastly different scenarios illustrate the interdisciplinary, systems-thinking approach. While they are presented in elementary, middle, and high school categories, the scenarios can be adapted to other developmental levels through the creativity of the teacher/facilitator.

ELEMENTARY SCHOOL LEVEL: THE PYRAMID

Reconstruction Systems Thinking Project

The primary task of this activity is to engage students in grades 3 and 4 in an activity that provides them with an opportunity to discuss and debate the system support mechanism that needed to be in place to allow the great pyramids of Egypt to be constructed.

Note: Student problem solving and thinking processes are the important aspects. This activity also focuses on the ability to communicate the results to other members of the class.

Background. The Great Pyramids of Giza, built over 4,500 years ago, continue to impress modern-day engineers and technologists. These tombs are the most famous pyramids, but there are more than 80 other pyramids in Egypt. The largest of the three, the Great Pyramid of King Khufu, was built about 2550 B.C. At its peak, it was 481 feet tall and had a square base of 756 feet on each side. Approximately 2,300,000 blocks of solid limestone, each weighing about 2.5 tons, were used in its construction. Many scholars have offered theories on how the Egyptian accomplished their construction; however, there is no definitive proof substantiating their findings.

The problem. The ancient Egyptians were faced with many problems while building the pyramids at Giza 4,500 years ago. One of the most obvious problems that they had was moving heavy blocks of stone (about 2½ tons each) into position to build the pyramid. The largest pyramid at Giza is over 450 feet high and used over 2 million stones. To imagine how high the pyramids actually are, they would be more than 1½ football fields standing end on end. ***The problem is to discover a successful technique to move a large stone up an inclined plane.***

The materials. The materials are a stone, an inclined plane, sand, water, rope, and wood.

Quality workers. The Egyptians needed to be quality workers. Clearly, their finished project is evidence of their ability to work both individually and in teams. Obviously, the Egyptians understood a great deal about technology and practical problem solving; they were critical thinkers who knew how to make decisions. We know that there was division of labor among the ancient Egyptian workers. For example, there were surveyors, stone cutters, rope pullers, engineers, and architects and designers.

The ancient Egyptians worked on the pyramids only three months of the year, when the Nile River overflowed. Workers demonstrated self-discipline and self-management skills. The Egyptians needed to be safety-minded to insure that the people who were doing this dangerous work would not be hurt.

Sample connections. Identified below are some examples of how the classroom teacher may emphasize various content areas around this specific activity and theme.

- **The Arts (Visual and Performing)**—Elements of design and aesthetics in the beauty of the pyramid itself may be explored. For example, the interior walls were decorated with paintings. Some of the objects found within the pyramid might be art or artistically designed products.

- **Comprehensive Health and Physical Education**—Students may explore the diet of the ancient Egyptians in explaining how they were physically and mentally fit for this arduous task.

- **Language Arts Literacy**—Although students will use all of their language arts literacy skills throughout this activity, emphasis may be placed on the student's ability to speak to his or her audience during a culminating presentation on the activity. Further research on topics of interest to the student may be pursued.

- **Mathematics**—Students will explore the importance of geometric shapes and properties in designing the pyramids.

- **Science**—Students will explore the impact of how the needs of the building system were satisfied by a variety of services. Students can construct a chart or diagram that illustrates a variety of system components that would be necessary to support the building project. Include items such as where the water to drink would come from and how it would have been transported and stored. Groups of students can discuss, research, and present to the class a variety of system needs, conveying what, where, and how much of the support would have been needed for the project. Discuss the principles of levers and wheels.

- **Social Studies**—The Egyptian culture will be explored. Students will examine the significance of the pyramids as well as how human beings learn to work together in teams. (It is estimated that between 40,000 and 50,000 people worked collaboratively on the goal of completing the pyramid.)

- **World Languages**—Students will explore related aspects of the Egyptian culture that required early settlers from different communities on the Nile to agree to use hieroglyphics to assist their interaction for the purposes of economics, agriculture, and the building of the pyramid.

Science and the Cross Content Workplace Readiness Standards

Comparing New Jersey's Science standards to New Jersey's Cross-Content Workplace Readiness standards (see chapter 2), it is evident that the development of the skills encouraged by the science process standards strongly support the workplace readiness initiative. Both sets of standards speak to the need for critical thinking, decision-making, and problem-solving. Both acknowledge the importance and appropriate use of available technologies. Both encourage learning by doing, and recognize the value of understanding how systems operate. And of course, both emphasize the need for safety in school, at home, and in the workplace.

The demonstration activities assembled in chapter eight of this framework have already provided many examples of how the workplace readiness standards can accompany quality science instruction at all grade levels. Being considered for the future is the publication of a more complete collection of model activities, emphasizing the interdisciplinary learning inferred by the "cross-content" standards.